



Department of
Community Investment

Redevelopment Commission Agenda Item

DATE: October 4, 2017
 FROM: Chris Dressel, Staff
 SUBJECT: Coal Line Trail Budget Request – Earth Exploration Professional Services

PURPOSE OF REQUEST:

Staff is seeking approval of the attached proposal from Earth Exploration, Inc.(approved by the Board of Public Works earlier this year) in the amount of \$17,820 for geotechnical engineering services associated with ongoing design of the Coal Line Trail, a multiuse trail project expected to be completed in 2021. The specific components of the proposal are summarized as follows:

- Performing up to ten exploratory test borings to an average depth of 10 ft and up to five test borings to a depth of 30 ft for the proposed retaining walls.
- Performing appropriate laboratory tests in accordance with INDOT guidelines including visual soil classification, hand penetrometer readings, moisture content, unconfined compressive strength, topsoil testing, and Atterberg limit determinations; and
- Preparing a technical report which will include a summary of our findings and recommendations for geotechnical considerations

Staff requests your approval of this service contract amendment. Please contact me at 235-5847 or cdressel@southbendin.gov if you have any questions.

INTERNAL USE ONLY: Project Code: _____
 Total Amount new/change (inc/dec) in budget: _____; broken down by:
 Acct # _____ Amt: _____; Acct # _____ Amt: _____;
 Acct # _____ Amt: _____; Acct # _____ Amt: _____;
 Going to BPW for Contracting? Y/N Is this item ready to encumber now? _____
 Existing PO# _____ Inc/Dec \$ _____



December 22, 2016

Mr. Kevin Fink
City of South Bend
227 W. Jefferson Blvd.
1316 County-City Building
South Bend, IN 46601



2204 Yankee Street
Niles, MI 49120
269-262-4320 or 574-233-6820
(FAX) 269-262-4479

7770 West New York Street
Indianapolis, IN 46214-2988
317-273-1690 (FAX) 317-273-2250

Re: Proposal for Professional Services
Geotechnical Evaluation
Coal Line Trail Phases I & II
South Bend, St. Joseph Co., Indiana
EEI Proposal No. P1-16-594

Dear Mr. Fink:

As you are aware, Earth Exploration, Inc. (EEI) was selected to perform geotechnical engineering services for the referenced trail project in South Bend. Based on preliminary plans provided by United Consulting (UC) and correspondence during several meetings in the last few months, we understand the trail will be constructed primarily along a former railroad corridor in the northwest part of the city. More specifically, the trail is planned to begin near the intersection of Wilber Street and Lincoln Way, extend north along the east side of Wilber Street to the former railroad, and then northeast along the railroad corridor. North of Vassar Avenue, the trail alignment continues along the railroad corridor which mirrors Diamond Avenue and Angela Boulevard. Rehabilitation of the existing railroad bridge over the St. Joseph River is planned to facilitate continuance of the trail to the east where this phase is planned to terminate at Michigan Street. The total trail length is about 8,100 ft and is planned to be constructed using federal funds.

Based on information shown on the preliminary plans, grade changes along a majority of the trail alignment are anticipated to be nominal with earth cuts and fills generally less than 2 ft. An exception to this is anticipated south of Portage Street, where up to 9 ft of fill is planned. We understand an existing bridge carrying Portage Street over the former railroad is planned to be replaced under a separate contract. However, as part of this project, we understand retaining walls are planned to be constructed in the vicinity of Portage Street in conjunction with the new structure. Details regarding the new walls are somewhat conceptual at this time. However, we understand that mechanically stabilized earth (MSE) fill is being considered and maximum retained heights are anticipated to be on the order of about 16 ft. Drainage along the corridor is anticipated to be conveyed to existing ditches and via new small diameter culverts. Based on the information provided by UC, rehabilitation of the existing bridge over St. Joseph River is not planned to include new foundation elements.

On other local trail projects, we have utilized test pits to evaluate the subgrade conditions and collect samples for testing. However, given the planned earthwork requirements (up to 9 ft of fill) and planned MSE walls, geotechnical soil borings will be required. As such, our scope of services is anticipated to include:

1. Performing up to ten exploratory test borings to an average depth of 10 ft and up to five test borings to a depth of 30 ft for the proposed retaining walls. The actual location, depth, and number of borings will be dependent on the soil conditions encountered and

forthcoming plans. Standard Penetration Test (SPT) sampling will be performed at 2½-ft intervals. We anticipate that the borings will be performed with ATV-mounted equipment and backfilled at completion of the field work with auger cuttings and bentonite chips. EEI will locate the test borings using measurements from existing site features shown on the plans. We will also contact Indiana 811 to arrange an underground utility line location check. Furthermore, we understand a wetland area has been identified between about Station 44+00 to 47+00 (north and south of Portage Street). During the preliminary field check, we plan to evaluate this area with representatives of UC;

2. Performing appropriate laboratory tests in accordance with INDOT guidelines including visual soil classification, hand penetrometer readings, moisture content, unconfined compressive strength, topsoil testing, and Atterberg limit determinations; and
3. Preparing a technical report which will include a summary of our findings and recommendations for geotechnical considerations regarding:
 - a. Subgrade preparation and improvement, as necessary, for support of the trail;
 - b. Re-use of onsite soil for fill;
 - c. Foundation recommendations for the proposed retaining walls; and
 - d. Potential construction problems due to the subsurface conditions encountered (e.g., soft subgrade difficulties, etc.).

SCHEDULE

We are typically able to mobilize to the site within two to three weeks of notice to proceed and coordination of our field activities with underground utility owners and the city. We anticipate that representatives of the city will coordinate with any property owners regarding right of entry to perform our field activities. The field work is anticipated to take two to three days to complete. After the field work is completed, the laboratory testing could take up to two to three weeks to complete. We anticipate submitting a geotechnical report within two weeks after the laboratory work is completed.

COST

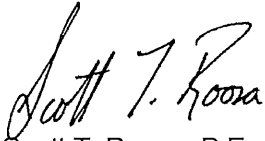
We propose to provide our services on a time and expense basis in accordance with the unit rates provided on the attached cost estimate. With that, we estimate the total cost for completing the geotechnical services to be \$17,820. Please recognize that the fee is based on the scope described herein and our experience on similar projects. Additionally, no fees have been included for tree clearing. If tree clearing is required, and cannot be performed by representatives of the city, we recommend including an additional \$600 for these activities. If any significant variations develop during the course of our evaluation, we will advise you so that our efforts can be effectively directed.

CLOSURE

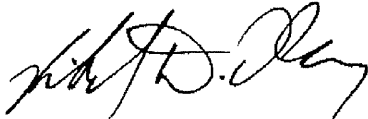
Thank you for the opportunity. We look forward to providing our services on this project. We anticipate that written notice to proceed will be issued separate from the execution of this contract. Should you have any questions about this information, please feel free to contact us.

Sincerely,

EARTH EXPLORATION, INC.



Scott T. Roosa, P.E.
Senior Geotechnical Engineer



Richard D. Olson, P.E.
President

Enclosure: Cost Estimate

Cost Estimate

Coal Line Trail Phases I & II
South Bend, St. Joseph Co., Indiana

	<u>Unit</u>	<u>Unit Price</u>	<u>Total</u>
<u>GEOTECHNICAL FIELD</u>			
1. Mobilization and Field Coordination			
a. SPT Rig	1 ea	\$260.00	\$260.00
b. CPT	ea	\$440.00	
c. Field and utility coordination	1 LS	\$600.00	\$600.00
d. Field coordination with property owners			
i. 1 - 10	1 LS	\$300.00	\$300.00
ii. 11 - 25	LS	\$500.00	
iii. Over 25	LS	\$690.00	
e. Mileage	40 mi	\$3.40	\$136.00
2. Truck mounted borings with split spoon sampling			
a. Standard	ft	\$18.50	
b. Night time	ft	\$21.80	
3. Truck mounted borings with drilling fluid			
a. Standard	ft	\$18.50	
b. Night time	ft	\$21.80	
4. Truck mounted core drilling			
a. Standard	ft	\$38.00	
b. Night time	ft	\$44.80	
5. Truck mounted borings			
a. Truck mounted borings through bedrock or boulders or concrete pavement			
i. Standard	ft	\$36.40	
ii. Night time	ft	\$42.90	
b. Bridge deck coring and restoration			
i. Standard	ea	\$330.00	
ii. Night time	ea	\$390.00	
6. Cone penetrometer testing			
a. Set up			
i. Standard	ea	\$75.00	
ii. Night time	ea	\$88.50	
b. Subsurface profiling			
i. Standard	ft	\$11.90	
ii. Night time	ft	\$14.00	
c. Profiling with pore pressure measurement			
i. Piezometric Saturation			
a. Standard	ea	\$91.00	
b. Night time	ea	\$107.00	
ii. Penetration			
a. Standard	ft	\$14.20	
b. Night time	ft	\$16.75	

	<u>Unit</u>	<u>Unit Price</u>	<u>Total</u>
iii. Pore water dissipation test			
a. Standard	hr	\$184.00	
b. Night time	hr	\$217.00	
iv. Hydraulic conductivity and consolidation			
a. Standard	ea	\$70.00	
b. Night time	ea	\$83.00	
d. Profiling with Shearwave Velocity Measurement			
i. Standard	ft	\$15.23	
ii. Night time	ft	\$17.97	
e. Sample			
i. Standard	ea	\$22.00	
ii. Night time	ea	\$26.00	
7. Hand or truck soundings			
a. Standard	ft	\$11.60	
b. Night time	ft	\$13.70	
8. Hand auger drilling			
a. Standard	20 ft	\$12.00	\$240.00
b. Night time	ft	\$14.25	
9. Skid mounted borings with split spoon sampling			
a. Standard	250 ft	\$29.00	\$7,250.00
b. Night time	ft	\$34.20	
10. Skid mounted borings using drilling fluid			
a. Standard	ft	\$29.00	
b. Night time	ft	\$34.20	
11. Skid mounted core drilling			
a. Standard	ft	\$42.00	
b. Night time	ft	\$49.00	
12. Skid mounted boring through bedrock or boulders			
a. Standard	ft	\$44.00	
b. Night time	ft	\$52.00	
13. Skid mounted soundings			
a. Standard	10 ft	\$16.40	\$164.00
b. Night time	ft	\$19.30	
14. Skid Mounted Cone Penetrometer Testing (CPT)			
a. Set up			
i. Standard	ea	\$110.00	
ii. Night time	ea	\$130.00	
b. Subsurface profiling			
i. Standard	ft	\$17.30	
ii. Night time	ft	\$20.50	

	<u>Unit</u>	<u>Unit Price</u>	<u>Total</u>
c. Profiling with pore pressure measurement			
i. Piezometric Saturation			
a. Standard	ea	\$108.00	
b. Night time	ea	\$127.50	
ii. Penetration			
a. Standard	ft	\$20.00	
b. Night time	ft	\$23.60	
iii. Pore Water Dissipation Test			
a. Standard	hr	\$216.00	
b. Night time	hr	\$256.00	
iv. Hydraulic Conductivity and Consolidation			
a. Standard	ea	\$83.00	
b. Night time	ea	\$98.00	
d. Profiling with Shearwave Velocity Measurement			
i. Standard	ft	\$23.50	
ii. Night time	ft	\$27.80	
e. Sample			
i. Standard	ea	\$31.00	
ii. Night time	ea	\$37.00	
15. Furnishing of a boat		Actual Cost	
16. Barge set-up expenses			
a. Navigable water			
i. Barge set-up	ea	\$5,600.00	
ii. Rental of support equipment and/or boat		Actual Cost	
iii. Drill rig down time	hr	\$140.00	
b. Non-navigable water barge set-up	ea	\$4,800.00	
17. Additional disassembly and reassembly			
a. Navigable water	ea	\$2,000.00	
b. Non-navigable water	ea	\$1,800.00	
18. Barge mounted borings with split spoon sampling	ft	\$32.00	
19. Barge mounted core drilling	ft	\$44.00	
20. Barge mounted boring through bedrock or boulders	ft	\$44.00	
21. Barge mounted soundings	ft	\$19.00	
22. Casing through water	ft	\$8.15	
23. Uncased sounding through water	ft	\$5.40	
24. Set up for borings and machine soundings			
a. Borings and machine soundings less than 20 ft deep	ea	\$68.00	
b. Rock core borings	ea	\$116.00	
25. Additional 2-in. split spoon sampling	10 ea	\$20.00	\$200.00
26. 3-in. split spoon samples	ea	\$22.00	
27. 3-in. Shelby tube samples	2 ea	\$60.00	\$120.00
28. Bag samples			
a. 25-lb sample	ea	\$50.00	
b 5-lb sample	ea	\$32.00	

	<u>Unit</u>	<u>Unit Price</u>	<u>Total</u>
29. Field vane shear test			
a. Standard	ea	\$110.00	
b. Night time	ea	\$130.00	
30. 4½-in. cased hole	ft	\$12.00	
31. Installation of Geotechnical Instruments			
a. Inclinator casing installation			
i. Standard	ft	\$14.07	
ii. Night time	ft	\$16.60	
b. Piezometer installation up to 25 ft below surface	ea	\$245.00	
c. Piezometer installation deeper than 25 ft below surface	ea	\$270.00	
d. Metal protective outer cover for inclinometer and piezometer casings	ea	\$120.00	
32. Geotechnical engineer	16 hr	\$115.00	\$1,840.00
33. Railroad expenses		Actual Cost	
34. Twenty-four hour water levels			
a. Field measurements per borehole			
i. Standard	6 ea	\$36.50	\$219.00
ii. Night time	ea	\$43.00	
b. PVC slotted pipe	ft	\$5.60	
35. Special borehole backfilling			
a. 0 to 30 ft			
i. SPT			
a. Standard	15 ea	\$105.00	\$1,575.00
b. Night time	ea	\$124.00	
ii. CPT			
a. Standard	ea	\$45.00	
b. Night time	ea	\$53.00	
b. More than 30 ft			
i. SPT			
a. Standard	ft	\$6.30	
b. Night time	ft	\$7.50	
ii. CPT			
a. Standard	ea	\$1.88	
b. Night time	ea	\$2.21	
c. Pavement restoration			
i. Standard	ea	\$58.00	
ii. Night time	ea	\$68.00	
36. Dozer rental		Actual Cost	
37. Traffic control			
a. Flag crew	day	\$700.00	
b. Equipment Rental		Actual Cost	
c. Flag crew with equipment	day	\$800.00	
38. Centerline surveying		Actual Cost	
Subtotal (Geotechnical Field)			\$12,904.00

	<u>Unit</u>	<u>Unit Price</u>	<u>Total</u>
<u>GEOTECHNICAL LABORATORY</u>			
39. Sieve analysis for soils	4 ea	\$48.00	\$192.00
40. Hydrometer analysis	4 ea	\$55.00	\$220.00
41. Sieve analysis for Aggregates			
a. Analysis by Washing (AASHTO T-11)	ea	\$75.00	
b. Analysis by Using (AASHTO T-27)	ea	\$131.00	
42. Liquid limit	4 ea	\$33.00	\$132.00
43. Plastic limit & plasticity index	4 ea	\$24.00	\$96.00
44. Liquid Limit Ratio	ea	\$74.00	
45. pH test	4 ea	\$15.00	\$60.00
46. Loss on Ignition Test			
a. Loss on Ignition Test (Conventional)	ea	\$23.00	
b. Loss on Ignition Test (Sequential)	ea	\$51.00	
c. Organic content based on Clorimeter	ea	\$23.00	
47. Topsoil Tests			
a. Phosphorus tests	2 ea	\$20.00	\$40.00
b. Potassium tests	2 ea	\$20.00	\$40.00
48. Moisture Content Tests			
a. Moisture Content Test (Conventional)	ea	\$6.50	
b. Moisture Content Test (Microwave)	ea	\$8.00	
49. Expansion Index of Soils	ea	\$230.00	
50. Specific Gravity Test	ea	\$35.00	
51. Unit weight determination	ea	\$17.00	
52. Hydraulic Conductivity Test			
a. Constant Head	ea	\$225.00	
b. Falling Head	ea	\$275.00	
53. a. Unconfined Compression Test	4 ea	\$44.00	\$176.00
b. Remolding of soil samples with chemical admixtures in chemical soil modification/stabilization (3 samples is equal to 1 unit)	ea	\$110.00	
c. Point Load Strength Index of Rock	ea	\$42.00	
54. Compressive Strength and Elastic Moduli of Intact Rock			
a. Compressive Strength of Intact Rock	ea	\$105.00	
b. Elastic Moduli of Intact Rock	ea	\$420.00	
55. Consolidation Test	ea	\$430.00	
56. Triaxial test			
a. Unconsolidated - Undrained (UU)	ea	\$336.00	
b. Consolidated - Undrained (CU)	ea	\$500.00	
c. Consolidated - Drained (CD)	ea	\$700.00	
d. Pore Pressure measurement with a. or b. and use of back pressure for saturation	ea	\$242.00	
57. Direct Shear Test	ea	\$520.00	
58. Moisture-Density Relationship Test			
a. Standard Proctor	ea	\$135.00	

		<u>Unit</u>	<u>Unit Price</u>	<u>Total</u>
	b. Modified Proctor	ea	\$147.00	
59	Soil Support Testing			
	a. California Bearing Ratio Test	ea	\$515.00	
	b. Subgrade Resilient Modulus	ea	\$600.00	
60	Collapse Potential Evaluation Test			
	a. Silty Soil (Loess)	ea	\$370.00	
	b. Cohesive or Expansive Soils	ea	\$441.00	
61	Water Soluble Sulfate Test	ea	\$100.00	
62	Water Soluble Chloride Test	2 ea	\$100.00	\$200.00
63	Soil Resistivity Test	ea	\$131.00	
64	a. Slake Durability Index Test	ea	\$122.00	
	b. Jar Slake Test	ea	\$13.00	
Subtotal (Geotechnical Laboratory)				\$1,156.00
<u>GEOTECHNICAL ENGINEERING</u>				
65	Geotechnical profile and related work			
	a. Without soil subgrade drawings			
	First mile	LS	\$1,150.00	
	Each additional mile	mi	\$525.00	
	b. With soil subgrade drawings			
	First mile	LS	\$1,365.00	
	Each additional mile	mi	\$600.00	
	c. Soil subgrade drawings (only)			
	First mile	LS	\$350.00	
	Each additional mile	mi	\$220.00	
66	Geotechnical report			
	a. Without soil subgrade investigation			
	First mile	1 LS	\$1,660.00	\$1,660.00
	Each additional mile	0.53 mi	\$700.00	\$373.86
	b. With soil subgrade investigation			
	First mile	LS	\$1,900.00	
	Each additional mile	mi	\$800.00	
	c. Soil subgrade investigation (only)			
	First mile	LS	\$600.00	
	Each additional mile	mi	\$360.00	
67	Settlement analysis and recommendations for embankment			
	a. Proposed embankment	ea	\$495.00	
	b. Proposed and existing embankment	ea	\$550.00	
68	Ground modification design	ea	\$1,450.00	
69	Slope stability analysis			
	a. C, ϕ or C & ϕ analysis	ea	\$770.00	
	b. Corrective measures	ea	\$770.00	
	c. Stage construction corrective method	ea	\$1,340.00	
70	Bridge foundation analysis and recommendations			
	a. Shallow foundation	ea	\$475.00	

	<u>Unit</u>	<u>Unit Price</u>	<u>Total</u>
b. Deep foundation			
i. Deep foundation analyses	ea	\$840.00	
ii. Wave equation analyses	ea	\$325.00	
iii. Liquefaction analysis	ea	\$260.00	
iv. Group - 3D analysis	ea	\$420.00	
c. Settlement analysis for bridge pier foundation			
i. Bridge pier	ea	\$380.00	
ii. Embankment plus pier	ea	\$420.00	
iii. Embankment plus pier plus all other loads	ea	\$485.00	
d. Foundation on bedrock	ea	\$370.00	
71 Retaining structure analysis recommendations			
a. Conventional retaining structures and other types such as MSE Walls and Bin walls			
i. Shallow foundation	2 ea	\$860.00	\$1,720.00
ii. Deep foundation	ea	\$1,130.00	
iii. Settlement analysis for retaining wall foundation	ea	\$370.00	
b. Pile retaining structure analysis and recommendations			
i. Free standing structure	ea	\$1,000.00	
ii. Retaining structure with tie-back system	ea	\$1,450.00	
c. Drilled-in-pier retaining structure analysis			
i. Free standing structure	ea	\$1,025.00	
ii. Retaining structure with tie-back system	ea	\$1,470.00	
d. Soil nailing wall analysis	ea	\$990.00	
72 Seepage analysis	ea	\$1,400.00	
73 Deep dynamic compaction analysis	ea	\$1,400.00	

Subtotal (Geotechnical Engineering) \$3,753.86

CONSTRUCTION INSPECTION AND MONITORING

74 Pressuremeter testing services	day	\$1,600.00	
75 Mobilization of testing equipment	LS	\$160.00	
76 a. Monitoring geotechnical instrumentation	hr	\$75.00	
b. Field Inspector	hr	\$75.00	
77 Integrity testing		Actual Cost	
78 Field Compaction Testing			
a. Dynamic Cone Penetration Test (DCPT)	hr	\$75.00	
b. Light Weight Deflectometer Test (LWD)	hr	\$75.00	
79 Dynamic pile analysis	ea	\$1,025.00	
80 Static load test	ea	\$1,025.00	
81 Dynamic pile load test		Actual Cost	
82 CAPWAP-C analysis	ea	\$480.00	
83 Final construction inspection report	ea	\$925.00	

Subtotal (Construction Inspection and Monitoring)

FOUNDATION EVALUATION BY NON-DESTRUCTIVE METHODS

84 a. Surface test/Pier or foundation		Actual Cost	
b. Borehole test/Pier or foundation		Actual Cost	

	<u>Unit</u>	<u>Unit Price</u>	<u>Total</u>
<u>GEOPHYSICAL INVESTIGATION</u>			
85	Geophysical Investigations		Actual Cost

GEOTECHNICAL PROJECT MANAGEMENT

86	Project Management		
	a. Project Coordination	mi	\$1,620.00
	b. Project Website	LS	\$3,420.00
87	Geotechnical Review		
	a. Structure Report	ea	\$325.00
	b. Roadway Report	mi	\$275.00

Subtotal (Non-Destructive, Geophysical and Project Management)

PAVEMENT INVESTIGATION

1.	Mobilization of coring equipment	LS	\$200.00
2.	Mobilization mileage for coring equipment	mi	\$1.85
3.	Pavement core (partial depth)	ea	\$125.00
4.	Pavement core (full depth)		
	a. Standard	ea	\$190.00
	b. Night time	ea	\$223.00
5.	Sub-base sample	ea	\$60.00
6.	Cement concrete pavement core density determination	ea	\$33.00
7.	Cement concrete core compressive strength test	ea	\$31.50
8.	Bituminous extraction test	ea	\$84.00
9.	Sieve analysis of extracted aggregate test	ea	\$56.00
10.	Recovery of asphalt from solution by Abson method	ea	\$350.00
11.	Theoretical maximum specific gravity test	ea	\$70.00
12.	Bulk specific gravity test	ea	\$30.00
13.	Air voids calculation	ea	\$28.00
14.	Core report for partial depth core	ea	\$34.00
15.	Core report for full depth core	ea	\$42.00
16.	Pavement analysis and report	ea	\$770.00

Subtotal (Pavement Investigation)

Summary of Fees

Geotechnical Field	\$12,904.00
Geotechnical Laboratory	\$1,156.00
Geotechnical Engineering	\$3,753.86

Construction Inspection and Monitoring

Non-Destructive, Geophysical and Project Management

Pavement Investigation

Estimated Total \$17,813.86

APPENDIX "B"

INFORMATION AND SERVICES TO BE FURNISHED BY THE LPA:

The LPA shall furnish the CONSULTANT with the following:

1. Plans prepared by the project design consultant.
2. Standard Specifications and standard drawings applicable to the project
3. Plans of existing bridge within the project limits
4. Utility plans available to INDOT covering utility facilities govern the location of signals and underground conduits throughout the affected areas
5. Provide access to enter upon public and private lands as required for the CONSULTANT to perform work under this Contract
6. Aerial Survey information